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The basic principles of organizing and administering the work of the rear services of an army were laid down in the draft of "Instruction on the Organization and Conduct of Work of the Rear" and in Number 2 of the "Collection of Materials for the Study of the Experience of the War."

In the draft the experience of the rear services in the offensive operations in winter, and, in the main, of the defensive operations of 1941/1942 were summarized.

The wide scope of the operations performed by the Red Army in the winter of 1942/1943 confirmed the main conclusions drawn in the "Instructions" concerning the organization and operation of the rear services.

The organs of the rear services drew heavily on the summary of the experience of the work of the rear services in 1941/42 for the Stalin-grad and other operations and this summary played an important role in the material technical support in these operations.

This paper is an attempt to draw summary conclusions from the experience of the organization of the Rear, its operation and its direction, mainly in offensive operations of 1942/43, conducted under difficult conditions for the Rear services, not having any precedent in previous experience. A study of the material shows that each of the operations had its own problems in the questions of organization and administration of the rear, created by the reality of the operational situation.

The variations show that the decision concerning the problems of organizing the rear can not be stereotyped, that each occasion the organization of the rear should be based on a realistic evaluation of the data concerning the operational as well as the rear situation, and an understanding of the processes going on at the front and in the rear. Thus, for example, the forward army depots deployed for all operations, but the distance from the front line varied, according to the situation from 20 to over 70 kilometres.

The mobile field and evacuation hospitals of the armies were echel-

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oned in two, and in several instances, in three lines.

Unit transport, as is correct, was employed to bring loads from the railroads together with the army transport, but as far as administration was concerned, it was either under direct control of the divisions, or else it was separated from the divisions and employed centralized by the chief of the army rear.

Many similar examples of different solutions to one or the other question of organizing supply and transport, depending on the situation can be found.

But all of them illustrate that in quickly developing mobile operations particular attention in the work of the rear services should be paid to the manoeuvrability of rear installations and of material reserves. Initiative, the tactical adaptation of the rear to the requirements of the operational situation, is the basis for this manoeuvrability and is the main problem of the administration of the rear in an offensive operation.

#### Particulars of Rear Organization

An army offensive operation may be conducted in varying terrain and under different operational conditions, therefore the organization of the army rear, in each separate instance, will have its own characteristic peculiarities.

As the battle experience of the Red Army has shown, offensive operations usually result, according to the forward movement of the troops in a significant separation of these from railroads (supply stations, unloading stations, army bases). For example, during the offensive operations of February, 1943, the 40th. Army of the Voronezh front moved 250 to 300 km. away, and the 1st. Guards Army in February, 1943, operated 450 kms. away from the railway supply stations. In the overcoming of such a gap it is absolutely necessary to provide uninterrupted service by the rear units from the rear to the front in order that <sup>in</sup> each phase of the operation there is close contact between the speed of advance with the means of supply and evacuation.

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Reserves of transport, of evacuation, medical, and of repair establishments, in combination with the repair at maximum speed of the enemy-destroyed rail and road communications, prove to be the necessary conditions for the uninterrupted support of an operation from the material technical point of view. The relocation of army bases with the purpose of shortening the distance of supply by road is a major measure to be taken during an offensive operation.

In the event that it is anticipated that the troops will move away from the railroads for a considerable distance, it is correct for an offensive operation to organize forward army bases on the ground (particularly when work on the repair of railroads will lag behind the tempo of the movement of the troops, in those situations when there are constructions on the railroad in the area of advance which could easily be destroyed by the enemy.)

Practically all the armies of the Western Front in the Moscow operations of 1941/1942 had such bases located 20 to 30 kms. from the troops although the departure positions were not far away from the railroads. The 49th. Army, in the Alekainsk operation (December, 1942) established the forward army base on the ground 25 kms. from the troops. Such bases also existed in the 1943 winter operations of the Southern, Don, and other Fronts.

An army during an offensive campaign will be assigned a more limited rear area, than in other types of operations. This peculiarity becomes particularly obvious when shock armies prepare for the breakthrough of strongly-prepared enemy positions. The rear area will be used by a large number of rear establishments and units as well as troops of the second echelon. In this event an army will not even have one road for each large formation. In the majority of instances two or even three formations will be based on one road. This requires close control of all the movement along the roads, sometimes the construction of new roads and even completely centralized control of all supply and evacuation in the hands of the Chief of the Army Rear with the employment of combined groups composed of army and troops transport.

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If sufficient transport is not available to supply the formations in the direction of the main thrust, the transport of troops of the second echelon and of the supporting units will be used in the first instance. Such a method was, for example, used by the 11th. Army during the offensive operations of the winter 1942/1943, with satisfactory results. In this army about 1200 vehicles per day made the round trip.

A railroad sector, quite often, will service the needs of not only one, but several armies. In this connection supply roads may often be located in the rear sectors of neighbouring armies, assigned by the Front command. An army, in these circumstances, may be assigned by the Front two or three, and sometimes only one, railroad station, as its base and supply station (for example, the 21st. Army in the Stalingrad operation, was based on one railway station).

Effective action in the rear of an advancing army by enemy aircraft may often result from saturation of the rear with various rear establishments and reserves and the concentrated layout.

During an offensive operation dangers for the rear may also arise from raiders, particularly when the offensive passes through a settled area which is hostile to the advancing armies. The possibility that the enemy would try to disrupt the preparations for the offensive by a counter attack should also not be disregarded.

In the instructions of the German High Command of the 21st. of October 1942 (see: Information Bulletin of the Main Intelligence Administration of the Red Army No.8 of 1943) it says: "In order to destroy Russian preparations for an attack, assault groups should be formed immediately for the purpose of destroying these preparations." All this requires adequate measures for the defence of the rear.

Despite the scorched earth policy employed by the enemy when he withdraws, experience has shown that an advancing army may be able to obtain considerable supplies locally. Thus, for example, one of the armies of the western front, in the winter of 1942, collected in the period of the offensive, 54% of its flour, 97% of its vegetables, 108% of the meat, 140% of the hay, 68% of the oats, of its monthly require-

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ments. In a more or less similar manner other requirements were filled from local reserves, liberated from the enemy, or evacuated by other armies.

In circumstances when an offensive developed at a fast pace and was connected with encirclement of the enemy, the latter not only was unable to destroy reserves but also had to leave behind much booty. This booty proved to be of decisive help to our advancing troops in the matter of running supply of the troops.

But it is rather risky to plan an offensive on the basis of local reserves and booty. One or the other <sup>item</sup> ~~may~~ may not be found and therefore it becomes necessary to have all the necessities for an offensive prepared beforehand.

Average requirements of an army are: about 0.25 to 0.5 units of fire, 0.5 refills of gas and oil, and one issue of food and forage. It has to be pointed out that the expenditure of ammunition is not even for each day of the operation. In the period of the battle for the tactical zone of the enemy the expenditure of ammunition depending on the character of enemy resistance, may vary between 1 to 2.5 units of fire, in 24 hours, and with a breakthrough of a strongly fortified area this may be even higher.

During the period of exploiting success the expenditure of ammunition may be reduced to 0.1 units of fire, and sometimes even lower. For example, in the Rzhev-Zubtsov operation (August, 1942) the 31st. Army in one 24-hour period of artillery preparation spent 1.5 units of 76mm., 2.25 units of 122 mm., 2.25 units of 152 mm., and 2.5 units of 203 mm., but in the following days their whole expenditure varied between 0.1 to 0.2 units of fire. The average daily expenditure of ammunition of the 49th. Army in the Aleksinsk operation in the period from the 15th. to the 25th. of December, 1941, was as follows: for hand and machine guns, 0.2 units; mines, 0.2 units; and artillery, 0.25 units.

The 20th. Army in January, 1942, at the breakthrough at the river Lama spent the following on the artillery preparation: 107 mm. mortar, 2.6 units; 120 mm. mortars, 1.3 units; 107 mm. rounds, 0.67 units; 122

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mm., 0.5 units; and 152 mm., 0.4 units.

For the 40th. Army of the Voronezh Front the following was planned for the 25 days of the January, 1943 operation: rifle rounds 1.7 units; sub-machine guns 4.5 units; anti-tank rifles 2.5 units; 50 mm. mortars 1.5 units; 82 mm. mortars 3.4 units; 120 mm. mortars 3.2 units; 45mm. rounds 4.3 units; 76 mm. rounds 3 units; 122 mm. rounds 4.5 units; 152 mm. rounds 5.4 units. But even though the operation was conducted at high speeds, this amount of ammunition was not sufficient and supplementary supplies had to be requested. By the end of the operation only 5 to 10 rounds per gun remained and between 50 to 60 rounds per soldier.

In the operation which destroyed the Germans around Stalingrad, the following amounts were spent in the period from the 10th. of January to the end of February, 1943: 990,098 mortar shells, small calibre artillery rounds 341,250; medium calibre (up to 122 mm.) 521,437; heavy calibre (up to 152 mm.) 43,864; rifle and machine gun rounds 24 million. For the whole front this represented an expenditure of 0.6 to 1.8 units of fire.

The large amount of ammunition in numbers and the relatively low number in units of fire in the described operation can be explained by the large amount of artillery. The number of artillery pieces and mortars per 1 km. of front amounted to 92 guns and 56 mortars in the 65th. Army and up to 130 guns and mortars in the 21st. Army.

If in the above example the number of guns was cut in half the number of rounds per gun could be doubled and so would the units of fire, that is, the number of units of fire would be 1.2 to 3.6, instead of 0.6 to 1.8. It follows, therefore that, if one discusses the number of units of fire expended, it first of all has to be established to what number of guns it refers.

According to already published information (Red Star number 175, 1943) the Germans assembled for their unsuccessful Orel-Mursk and Belgorod-Mursk operation (July, 1943) 5 to 8 units of fire per division.

The heavy expenditure of ammunition for an artillery preparation for the battle for the tactical defence zone requires the dumping on

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the ground (at artillery fire positions and the field depots of the rifle formations) of ammunition commensurate with the requirements of the preparatory fire, and, in addition, to the amount of the required reserves.

Such an accumulation of ammunition, as is proper, will be required for all offensive operations. For example, the 20th Army, during its offensive operations on the river Iama accumulated at its fire positions up to 2.5 units of fire; the 49th Army, in the Aleksinsk operation in December, 1941, accumulated on the ground 3 units of fire; the 30th Army, in the Rzhev-Zubtsov operation in 1942, collected reserves, at the fire positions, of 1.5 to 2.5 above the carried reserves. In the Stalingrad operation orders were issued to accumulate mortar troops and at each defended position, all types of mortar bombs and rounds for the 81 mm. and 76 mm. regimental guns - 2.5 units and for the remaining guns 3 units of fire.

The experience of the Orsk-Malgorod action (July, 1943) shows that it is necessary to arrange for supplies and ammunition for the infantry as well as for the artillery. The disregard of these items in the above action required extreme measures for the supply of the small arms ammunition within the first few days (the small arms ammunition had to be flown in).

The timely unloading of artillery ammunition at the fire positions requires that these be selected well in advance since in an offensive operation the artillery will only occupy its positions just before the start of the operation.

The forward movement of supplies is also often made more difficult because the major part of the troops designated for the offensive will be located in the depth, at the rear, and will use roads at night to march to their departure positions. For that reason the transport of supplies at night will not be possible. Frequently, therefore, supplies will have to be moved during the day, employing a system of dispatching load vehicles in small numbers, or even singly, with large intervals.

The most expedient method of bringing up and of stockpiling sup-

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lies is to do it continuously and well before the concentration of the troops (example, the Orel operation of 1943). To ignore the necessity for the timely bringing up and stockpiling of supplies and reserves for an offensive, and of organizing the transport during the operation will often lead to misfortune. The lack of success of the 7th. Army in the Orel operation in April, 1942, was to a great degree due to the fact that the supplies and materials necessary for the operation of the army were late in arriving and that neither the troops nor the divisional supply points had the necessary reserves.

The successful offensive of the 252nd. and 246th. Rifle Divisions in the Malinin operation of the 9th. December, 1941, collapsed only because the operation was started when only 0.3 units of fire were available.

To assure the material security of a mobile group prior to its action in the enemy's depth should be one of the major cares of the Front and Army Command in the preparatory period.

The material reserves for such a group should be collected in the preparatory period and should be dumped immediately behind the front line of our rifle troops. It follows that a reserve of transport vehicles should always be available in readiness to follow the mobile group and to deliver the necessary loads. It is of particular importance to have air transport available in order that supplies can be delivered by air. Disregard of the necessary supply planning for the mobile group may lead to its extinction, and in the most favourable case, failure to achieve success. For example, in the Teletsk operation (December, 1941) the mobile group (1st. Cavalry Corps) after having reached the rear of the German grouping could not destroy it because of lack of supplies. There was no forage for the horses, and there were only three rounds per gun left to the artillery. As a result of this the German units were able to break out of the encirclement.

The 8th. Cavalry Corps, when it was committed into the breakthrough (in the Stalingrad operation from the 19th. November to the 2nd. of December) had to leave behind the 174th. Tank Destroyer Artillery Reg-

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iment, because of lack of fuel. In the same operation the 4th. Cavalry Corps was given the 85th. Tank Brigade without fuel.

In the initial phases of an offensive losses in men and horses can be quite heavy, which requires that all medical (and veterinary) establishments be cleared of all wounded and sick, as well as the addition of reserve medical establishments and their location as close as possible to the troops.

To make an estimate of the expected losses is particularly difficult and they vary widely in individual operations. Thus, the losses of the 49th. Army during its offensive from the 16th. to the 25th. of December, 1941, averaged 7% of the overall strength of the troops of the army, while the losses of the 3rd. Tank Army from the 22nd. to the 31st. of August, 1942, reached 40% of the overall strength of the army; the overall losses of the 40th. Army during 25 days of an offensive (January - February, 1943) were 20% of which 5% were sick. The losses of the 22nd. Army during 10 days of offensive combat (winter, 1942) did not reach 15%. The losses in the Stalingrad operation from the 19th. of November to the 2nd. of December, 1942, in the 8th. Cavalry Corps were 5,892 men (about 36%) and for the 3rd. Cavalry Corps from the 19th. to the 26th. of November, 9,308 men (about 45%).

For operational planning one can assume that an army will suffer 15% to 20% loss in a ten-day operation. Of this there will be 20% to 30% permanent casualties and 80% to 70% sick and wounded of which number about 10% will require evacuation on special medical transport, while the remaining ones may be evacuated by <sup>returning</sup> ~~returning~~ vehicles.

These losses in personnel are based on the experience of several armies, namely: 1. the 49th. Army during all three phases of the operation from the 16th. of December, 1941 to the 15th. of February, 1942, had a ratio of 20% of all casualties killed; 2. the 3rd. Tank Army, which during the offensive from the 22nd. to the 31st. of August suffered casualties of 21,169 wounded to 5,210 killed, that is, the proportion of the killed to the wounded was about 25%; 3. the 40th. Army, in which 1710 were killed out of a total number of casualties of 8550,

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(or 20%).

The American losses in the operations against the Japanese on Attu (May, 1943) were 1135 wounded and 342 killed, that is, the proportion of the killed to the wounded was about 30%. According to a statement by the American Minister of War Stimson, (Pravda No. 161 of 1943) the overall losses of the American Army were 17,178 men wounded and 7,528 killed, that is, about 30%. According to the figures of the 9th. German Infantry Division (a captured document) their ratio of killed to wounded was 30%. A somewhat different proportion between the killed and wounded was experienced by the English in the Egyptian campaign (from the 23rd. of October to the 7th. of November, 1943) where out of the overall figure of losses of 13,500 men, there were 12% killed, 63% wounded and 25% unknown lost. The relatively low percentage of killed can be explained by the fact that a part of the killed were included in the figure of "unknown lost".

It has to be observed that the greater proportion of the losses (up to 50%) occur in the first two or three days of the operation.

The losses in horses, according to the experience of war, amounted to 5% for a ten-day operation, of which 30% to 40% were total losses. In the cavalry these losses may be considerably higher.

For example, in the Stalingrad operation, the 8th. Cavalry Corps lost 7030 horses (over 50%) in the period from the 19th. of November to the 2nd. of December, 1942; while the 3rd. Cavalry Corps lost 6,441 horses (over 30%) between the 19th. and the 26th. of November, 1942, and the 4th. Cavalry Corps lost over 65% of its horses from the 19th. of November to the 18th. of December.

The losses in horses increase sharply in winter because of the cold and the greater scarcity of forage.

In an offensive operation where the field of battle is retained by the advancing forces, there exists the possibility to conduct running, medium, and with the arrival of repair facilities, even capital repair of battle equipment in the immediate rear of the troops. To

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achieve this army repair establishments will have to send out repair facilities directly to the troops.

The losses of equipment for a ten-day operation may reach the following figures: 3 to 4% of the artillery; 30 to 40% of tanks; and 10 to 15% of the transport vehicles. Of this number 10 to 15% are total losses; 20 to 25% require capital repair; and the remainder medium or running repair.

The quoted figures are only approximations, but support for these is found in the reports of the 3rd. Tank Army, which in the operation from the 22nd. to the 28th. of February, 1942, lost 50% of its tanks, of which 25% were total losses, 20 to 25% required capital repair and the remainder were equally divided as requiring medium and running repair.

Of great importance in an offensive operation is the proper organization of the service for collecting, evacuation, and utilization of captures equipment. If not sufficient attention is paid to this problem and the collection of booty is not organized in such a manner as to provide for speedy collection of the equipment, the greater part of it may be lost; vehicles will be stripped by the local inhabitants and troops passing by; small arms will be lost likewise, and in winter, when they are covered by snow they cannot be found, etc.

For the offensive by one of the armies of the Don Front in January - February, 1943, the Military Council organized the following units for the collection of booty: in regiments - "booty commands", in divisions, - "booty companies", and in the army, - "booty battalions".

Also of great importance in an offensive operation is the service for collecting and transporting prisoners of war, the number of which can be considerable during a successful operation. For example, one of the armies of the Don Front during its offensive, captured over 25,000 prisoners, and the 40th. Army 28,038.

During an offensive operation the flexibility of rail and road transport in the forward movement of supplies to the rear and to the reserve establishments of an army is of great importance.

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A necessary aspect of this flexibility is to adapt itself to the operational situation, the re-grouping of troops, the uneven requirements for one or the other part of the rear service, for special supplies for each phase of the operation, and in separate directions and all that with all of the large establishments along the road destroyed.

This flexibility will include:

- a. The re-location of the bases of the whole army or its individual formations to a different railway and the transfer of the supply and unloading stations. Thus, for example, all the armies of the western front transferred their bases from the railroads east of Moscow to the western ones during the Moscow relief operation.
- b. The change in direction of the roads used for supply and evacuation.
- c. The change in the means and method of supply. For example, 1. when supply by railroad is disrupted - road supply has to be substituted 2. When a railroad bridge is destroyed this will require unloading at the place of destruction, then the re-loading of the cargo into rafts or boats or even trucks (if a crossing by road is possible) and the trans-shipment to the far shore, after which the cargo will have to be re-loaded on the railway for shipment to its destination. This demands the availability on the other shore of railway equipment (cars and engines) or else the further movement will have to be accomplished by motor transport; 3. When certain sectors of the roads are impassable for trucks, tractor-drawn or horse transport will have to be used.
- d. The re-grouping of medical, veterinary, repair and evacuation establishments, the road exploiting and transport units and associated units and the supply of their reserves.
- e. The increased release of combat supplies to one unit in place of another.

The Preparation and Tasks of the Rear in the Period of an Offensive

Required for the organization of an army rear during an offensive is the necessary time to stockpile supplies on the ground and to re-

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plenish the reserves on wheels. The time will depend on the type of operation, the distance separating the troops from the supply bases, on the availability of transport, the condition of the roads, on the amount of reserves which it is necessary to have supplied to the troops for the attack.

The time may vary from two days and less (if a weak position is to be attacked) to ten days and more prior to an attack on a heavily fortified position. The preparation for the attack of the 20th. Army for the breakthrough in January, 1942, at the river Lama, required five days; nine days were required for the preparation of the rear for the Rzhev-Zubtsov operation (August, 1942) by the 31st. Army; while the armies of the southern and south-western fronts in the Barvenk - Lozovsk operation (January, 1942) required fifteen days.

It is obvious that the preparation of the rear should coincide with the period which has been set aside for the troops to prepare their offensive. In principle, it is desirable that the rear preparation should be started as early as possible and that it be finished by the time that the troops start to concentrate in their departure positions. From the point of view of the requirements placed on the rear during offensive operations, its progress can be divided into three phases;

1. the period of preparation
2. the period of combat for the tactical zone
3. the period of the exploitation of the success.

In the preparatory period measures are taken to insure adequate supplies and reserves for the offensive in the army bases, at supply stations, at the forward army supply depots on the ground, as well as the issue of reserves of ammunition to the troops - at the fire positions and in the divisional mobile depots. These should be large enough to satisfy the requirements of one day of battle over and above the standard amount of mobile reserves carried.

It should be borne in mind that it is necessary to dump supplies on the ground not only for the present components of the army but also for those troops which will be attached.

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When the number of available roads is limited and there are heavy supply requirements, it is advisable to centralize control in the hands of the armies' chief of the Rear.

The forward movement of supplies should be planned in close cooperation with the Army's operational section because the preparation of the offensive may require extensive re-grouping of troops. In many instances when time is short, the roads cannot be made available for the transport of supplies.

In the preparatory period roads are repaired, and, if necessary, supplementary roads are built, communications are organized, as well as traffic control being planned. Supply centres, as far as possible, will lead up to the front line.

The rear units and establishments will deploy in relation to the troops and as close as possible to them in order that they may continue to serve them during the advance, while remaining stationary.

The rear establishments and troops will relieve themselves of all sick and wounded as well as of all unnecessary equipment,

In connection with the fact that new units and formations will usually join an army during the preparatory period, and re-grouping takes place, it is usually necessary to re-organize the basing of the troops and to provide them with the necessary depots, bases and supply stations.

The running supply of the units, which have newly arrived by rail or road often presents difficulties, because these units frequently do not have any reserve <sup>supplies, and</sup> ~~despatches~~ besides, their rear establishments are usually despatched as the very last, and are therefore late in arriving. Troops finding themselves in such a situation, separated from a railroad, even by a small distance, find themselves without a rear, without supporting establishments and reserves, which places them in a truly difficult position.

Of interest, in this connection, is the experience of the material supply of one of the tank corps. This corps, organizing a march into a new area, did not have enough transport to move all its material

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supplies; it therefore loaded its allotted supplies which consisted of three fills of POL, two units of fire and five days' rations on the tanks and arrived fully supplied at its departure positions.

Besides that, in the preparatory period, all the other matters necessary for the uninterrupted work of the rear during the offensive are taken care of: the new locations which the subunits of the rear are going to occupy, during the advance are selected. The roads are reconnoitred and so are any buildings in the area of operation; the necessary materials are prepared for despatch, medical facilities are readied etc.

To summarize, the uninterrupted functioning of the rear during the course of the offensive depends to a great degree on the careful fulfilment of all the preparatory work.

Period of Combat for the Tactical Zone : This period of the operation is characterized by the large scale expenditure of ammunition for the breakthrough of the enemy's defensive zone. The dumps on the ground reserves are used up. The transport of loads from the rear to maintain the required reserves on wheels is increased. During an offensive operation the number of casualties in men and horses always increases and this will increase the work of the medical and veterinary establishments.

The Period of the Exploitation of the Success: In this period of the operation, side by side with the repair of roads and the forward movement of the supply points, the work of re-locating the bases of the whole army or of separate formations along the new railway direction will have to be accomplished.

The steady increase of road transport in direct proportion to the growing distance which separates the advancing troops from their bases is the most important condition to insure uninterrupted supply of troops in this period. The mobile reserves carried by the troops will require continuous replenishment. It is not permissible to leave successfully advancing troops without supplies so that they cannot subdue enemy resistance in this critical period.

The collection and counting of weapons and equipment which have been left behind on the field of battle by our troops or by the enemy

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will have to be organized in the exploitation period and so will the guarding and removal of the prisoners of war.

In the period of pursuit, the army will have to maintain freedom of movement: the rear of the army has to be relieved of anything which is not directly connected with the combat tasks. The evacuation of sick and wounded men and horses, and the removal of unserviceable equipment as well as booty will have to proceed at an increased tempo.

#### The Rear Services Plan for an Offensive Operation

A modern army, composed of 6 to 8 divisions, 10 to 15 artillery regiments, and reinforced by 1 tank or mechanized corps may, in an offensive operation, be given an assignment with a depth of 100 to 120 kms.

The length (on the average) of such an operation will be 10 to 15 days.

The plan for the rear services to insure adequate material supply will be worked out by the chief of the rear of the army for the whole period of the operation. The rear services and supply plan for the preparatory period and the first phase of the operation are prepared simultaneously. For the later phases the organization and order of supply will have to be evolved as the situation develops.

The plan will be based on the army commander's decision in the rear which will be given at the same time as the operational plan. Before the army commander's decision is made he will want to have information concerning the condition and the capability of the rear services, and, therefore, the chief of the rear and the chiefs of the responsible arms and services should be prepared to supply the necessary data.

The summary submitted to the army commander will contain information of a different character, but the chief of the rear should be prepared to report on the following matters:

- the amount of material (by types of supply) held by the army or in the vicinity of the troops.
- the amounts of material supplies released by the front and the time of their expected arrival.

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- utilization of local resources.
- the number of transport vehicles available to the army and held by the troops and their load capacity.
- the rear units and establishments available and those expected for the offensive.
- the capacity of the various echelons of medical and veterinarian evacuation.

- the number and the condition of roads in the rear areas.

The Commander's decision concerning the rear services will include

- instructions in how many, where and at what time reserves will have to be stockpiled to secure the operation.

- the setting of limits of consumption.

- details of the boundaries of the troop rear areas.

- instructions concerning the types and categories of sick and wounded to be left in army establishment until recovery and which categories are to be evacuated by the Front rear establishments.

- instructions concerning the direction in which the greater part of the rear services should be concentrated, as well as those concerning the more important roads to which greater attention is to be paid.

From the operational plan the chief of the rear should know:

- the forces and equipment assembled for the operation and their grouping.
- the expected duration of the operation.
- the scope of the operation (width and depth) and its limits.
- the starting time of the operation.

The Army Commander may sometimes issue his instructions concerning the rear before the final operational plan has been worked out; that is, when the operation is still in the planning stage. In such an instance the instructions are going to be more of a general character, that is, the Army Commander, without explaining his purpose, may issue orders to stockpile material reserves in one or the other direction, to relocate rear units, establishments, and require the clearing of hospitals and other medical establishments for the sick and wounded.

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The Rear Services Plan for an offensive operation will provide for

a. material supplies and supports for the operation, that is, the total amount of material with which the army is equipped and which is necessary for the operation. The types and requirements of various types of supplies include: ammunition - in units of fire, as well as by types and calibres; POL - in refills, by tons and nomenclature; food and forage - in rations, and by types, according to the norms laid down by the army commander.

b. Repair of Railroads. Despite the fact that the reconstruction of the railroads, as is proper, will be done according to the Front's plan by the forces and equipment of the People's Commissariat of Passenger Communication, the chief's rear plan for presentation to the Army Military Council has to take this problem into consideration. At the same time control of the reconstruction work will have to be assumed and the necessary help to the repair organs will have to be provided.

The plan for the reconstruction of a railroad will have to include a summary of the following problems:

- the size of the repair force, its equipment and disposition.
- rate of reconstruction per day.
- the time requirement to repair the large constructions, bridges etc. and railroad stations, designated as sub-supply stations.
- the organization of by-passing (crossing) the large constructions while these are being repaired.
- the capacity per day of the reconstructed railway line.
- the order in which repair material will be secured.

When a double rail line has to be constructed, it is wiser not to start work on both lines, but on one only. This will provide the possibility of using material from one rail line for the repair of the other. This will increase the speed of repair considerably.

c. The Army bases and their re-location. In the plan of the rear services the army has to provide : on which railroad the army will be based at the start of the operation and during the various phases; the volume of reserves which it has been planned to stockpile at each supply

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station (or army base), the order of relocation of the field depots of the army bases; which forces and arms will be serviced from the supply stations; unloading stations; army bases; and forward army bases.

Based on an evaluation of the conditions of the road, the plan will provide:

- the development of the Army military automobile roads of supply and evacuation during the progress of the operation; the forces and the material required for it.

- the supply and evacuation routes for the formations and the reinforcing units, as well as the army components assigned for their repair and maintenance.

The army components have to maintain the roads up to the divisional exchange points.

The commander, detailing the boundaries of the rear areas of rifle divisions have to bear in mind that the rear area of each rifle division have adequate routes to the supply station.

The assignment of bases and supply routes to formations can be laid out in the following chart:

Formation	Name of base	Distance from troops in km.	Supply Routes	Serviced by whom
5th. & 15th. Rifle Div. 3 Mecz. Corps (until August 23)	Butovo	75-90	Road: Butovo to Malomovo Rd. Maintenance co Bn. further by Rifle Div.	
	Saran (from Aug. 23)	40-75	Saran, Malomovo, the same to Ivanovka, Bokovo.	Ivanovka, then Rifle Div.
6th. & 18th. Rifle Divs. 3rd. & 4th. Tank Bns.	Goresolovka (until Aug. 24)	60-80	Road 1-Masinovo, 1st 2 Co's of Sokolovka, Graby 2 Road Bn. 2 Co., 2 Rd. Const. Bn.	
	Isayevo	50-90	Isayevo, Sokolovka, Petrovka	same
7th. & 10th. Rifle Divs. 3rd. & 4th. Tank Bns.	Kryukovo (until Aug. 24)	76-90	Rd. 2 Kryukovo, 3, 4 Co's, 2 Rd. Petrovo, Nikonovo Main. Bn. 3 co. 2 Rd. Const. Bn.	

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20base  
Mobile artillery, area  
Sokolovo from Aug. 24.

40-75

Sokolovo, Sidorono, same.  
Pestovo, Gordovka

etc.

Rear  
d. The ~~RA~~ Boundaries: Depending on the operational situation, the basing of troops and the supply routes assigned to them, the plan will designate the boundaries of the rear area. In the designated areas there will be disposed the rear services of those units which did not receive an independent service area. The plan will also designate the boundaries with the rear areas of the neighbouring formations.

In the event that the supply station will be moved forward during the advance of the troops, the boundaries of the rear areas will be extended forward.

At the start of an operation the depth of a rear area should be at a minimum. By the end, it may have to be extended considerably.

e. Supply by Railroad: The plan for supply by rail should include: what supplies and in what volume will have to be brought for the operation in the total and on the average per day: how many trains are required for this. Besides, that the amount of the material required for the maintenance of the railway will have to be taken into consideration, the transport of reinforcement (men and horses), the transport of the additional troops assigned to the operation, etc.

Having established the grand total of the rail shipments per day of the operation, it is necessary to decide in the event that there is not sufficient rail transport available, which loads can be taken off and sent by road or by some other means. During a timely preparation for an offensive it is absolutely necessary to employ as much rail and water transport as possible because the roads will be fully occupied by operational movements.

The plan for supply by road consists of two parts: the first provides for the movement of supplies to replenish the reserves and the stockpiling of the necessary reserves on the ground by the start of the offensive, the second - the supply during the operation.

For the preparation of the first part of the plan the amount of

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of requirements (in units of fire, refills, daily rations and by weight) will have to be worked out for each formation (Rifle Division) and all the reinforcing units. These requirements will have to be balanced against the available transport and the time limits set for the delivery of the loads, then it has to be estimated when the supply movement can be finished. For example, the period for the preparation of an attack is ten days. To replenish the troop holdings requires the transport of 1800 tons, for the running expenditure until the start of the operation, 350 tons daily are required, for ten days this comes to 3500 tons. Besides that, it is necessary to stockpile on the ground and at the fire positions 10,000 tons (included in this are the ammunition requirements of the additional troops). This gives a total of 14,500 tons per day. The road distance to the divisional exchange points and the artillery fire positions is 30 to 40 kms. For the daily transport of 1450 tons, 290 ZIS-5 trucks will be required with the assumption that each vehicle would make two round trips (the average load per truck is taken as 2.5 tons).

Assuming that the army has 140 ZIS-5 trucks it follows that in order to complete the assignment there is a shortage of 150 vehicles. This deficiency will have to be made up by the addition to the army transport of the transport held by the troops. Assuming that the troops have 300 transport vehicles and in four days with the arrival of the reinforcements this number will be increased to 500, this amount of transport will be more than sufficient to transport the supplies from the divisional exchange points to the artillery positions. 150 vehicles can easily be taken from them for ten days. There is enough transport left with the troops to accomplish all the internal tasks.

The withdrawing of the transport vehicles from the troops should be done as follows - a survey of the units is made from which the transport will be assigned to the ~~army~~ <sup>army</sup> column, and the time and place for their collection will have to be set.

The planning of the supply is not finished with the accounting. For a realistic accomplishment of the supply a daily transport



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plan will have to be prepared.

The second section of the plan (supply during the operation) will be worked out on the basis of an overall estimate of all the supply requirements divided into average daily requirements. Let us take for an example that the army for its offensive requires 4 units of fire (12000 tons), 5 refills of POL (1200 tons), 10 issues of food and forage (2000 tons), a total of 15,200 tons. From this amount 10,000 tons were dumped at troop exchange points during the preparatory period. It follows that during the operation the requirements would be 15,200 tons less 10,000 tons, that is, 5,200 tons, or an average of 520 tons. The transport of such an amount will require 205 ZIS -5 trucks if the road distance is no more than 75 kms (such a distance, assuming that the speed of advance is 10 kms. per day, will prevail till the end of the 4th. day of the operation). Starting with the 5th. day of the operation the road supply distance will increase by 10 kms. per day, and by the 10th. day, will reach 135 kms. it follows that instead of 205 trucks, twice that number (410) will be required. Even allowing that the army had 250 vehicles available it would not be able to cope with the supply after the 7th. day. Help from transport units of the front or from troop transport will be necessary.

If the staff planned the operation by days and boundaries, the supply plan may also be worked out on a daily basis, taking into consideration the daily supply distance.

Much more difficult is the organization of the transport when there is only a short preparatory period, when it is necessary not only to replenish troop holdings but also to accomplish an artillery dumping program within one or two days. Additional difficulties may arise because prior to an offensive the roads will be used at night for the re-grouping of the troops. Transport during the day will be either entirely excluded or else strictly limited. Not to be excluded is the possibility that one has to dispense with the supply of even the mobile reserves of POL and food and to transport ammunition only.

The supplies for the following phases may move at an average per \*

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day.

In all instances in which supplies have to be dumped on the ground a labor force for loading and unloading will have to be provided, since the drivers cannot cope with this work.

On an average one has to calculate for loading and unloading of a train 500 man hours and for one truck one man hour.

Medical support. The plan for medical support of an operation should provide for:

- a. to free all medical installations from all sick and wounded.
- b. to relocate all these installations as close to the front as possible and to group them in the direction of the main thrust.
- c. to reinforce with army facilities the troop medical echelons (medical sanitary battalions) in order that qualified surgical assistance may be accorded to the wounded not later than 6 - 15 hours after the injury (In the majority of instances men do not die because of their wounds, but because of lack of surgical attention.)
- d. a system of evacuation and treatment.
- e. sanitary prophylactic measures in order to prevent epidemics.

As the basis for the plan will serve the available medical establishments in the army, the expected number of casualties for the period of the offensive and the proportion in these casualties of sick and wounded. It is obvious that the number of wounded can only be estimated roughly, based on past experience, the expected enemy resistance and the means available to subdue it.

Experience has shown that an army can expect 10 to 15% casualties of its total personnel during a ten-day operation, of which the greater part (up to 50%) will take place during the first days of the battle. Of this number 20 to 25% will be permanent casualties and the remainder sick and wounded.

By types of casualties one can estimate that 5% of the total will be lightly wounded with a recovery period of ten days (these will remain in the medical sanitary battalions), 5% therapeutical cases and 90% wounded with recovery periods of over ten days, of the latter 50 to

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60% are lightly wounded with a recovery period of up to a month and a half, and 40 to 50% with a longer period of recovery. It should be pointed out that of the total wounds suffered 80% are in the extremities and 20% in the head, chest, and abdomen.

Guided by the above estimates of casualties, one can more or less decide the medical evacuation facilities of an army and on the basis of this division relocate the army's medical establishments, establish a system of evacuation, and provide facilities for treatment for each echelon of medical evacuation.

**Veterinary Service:** The plan for veterinary support will follow similar lines. It has to be borne in mind that during an offensive there does not exist the necessity for evacuating horses to the rear of the front since most of them will remain after treatment in the army or troops service area.

The number of expected sick and wounded horses for an operation may reach the figure of 4 to 5% of the total number of horses in the army.

**Repair and Recovery:** The plan will provide for accepting for repair and repairing, the relocation of the army repair facilities and the evacuation of equipment not required by the troops.

**Evacuation of Prisoners of War:** The plan will provide for the relocation of receiving points for prisoners of war (these receiving points will be organized by troops of the N : V D) the provision of rations and the order in which the troops will be moved from the troop rear areas to the army receiving stations, and from these points into the depth of the rear into the front receiving stations.

**Organization of Communications:** The signal plan has to provide constant means of communications for the chief of the rear with all his units and establishments as well as with the second echelons of the headquarters of the troop formations. As a minimum the chief of the rear should have communication with the technical means from the army bases, the supply stations, the chiefs of the military automobile roads, and the army supply roads; the second echelon of the headquarters of formations, and the headquarters of the field evacuation point and the

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## Main Field Evacuation point.

Guarding and defence of the Rear: The plan for the defence of the rear during an offensive should provide for a system of anti-aircraft defence of the rear area as a whole and of individual objects, as well as ground defence of the main rear installations. The plan for the organization of the rear and the material supply of an offensive operation can never be completely firm. Battle conditions will bring daily changes they will improve or worsen the working condition of the army's rear, but, despite this, the plan, adapted as closely as possible to the requirements of the army, will be a guide to activity of the rear services.

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